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10/529,437	08/03/2006	Wolf Steffans	20020479-02	2200

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EXAMINER	
STAFFORD, PATRICK	

ART UNIT	PAPER NUMBER
2828	

NOTIFICATION DATE	DELIVERY MODE
05/01/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPOPS.LEGAL@agilent.com

Office Action Summary	Application No.	Applicant(s)	
	10/529,437	STEFFANS ET AL.	
	Examiner	**Art Unit**	
	PATRICK STAFFORD	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-17_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-17_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

3DETAILED ACTION

Response to Amendment

Claims 1, 5, 9, 10, 12, 13, 17 amended on 1 February 2008.

Response to Arguments

Applicant's arguments filed 1 February 2008 have been fully considered but they are not persuasive.

In response to applicant's argument that Fox '834 does not teach a cavity that is continuously tunable in wavelength, Fox '834 is introduced to teach the limitation of a second reflecting element or redirection element being rotatable about an axis by at least 360 degrees (col. 2, lines 15-21 and Fig. 1, part 22) for providing a continuous movement of the second reflecting unit or redirection reflecting unit along a circle path with respect to said grating (col. 2, lines 45-54). Fox '834 is not relied upon to teach the continuously tunable laser. Fox '834 is combined with Mehuys '432, which is relied upon to teach the laser structure of claims 1 and 9. Mehuys '432 does not teach the second reflecting unit (Fig. 15, part 152) being rotatable about an axis by at least 360 degrees for providing a continuous movement of the second reflecting unit or redirection reflecting unit along a circle path with respect to said grating. However, the combination of the laser structure taught by Mehuys '432 and the reflecting element/redirection element being rotatable about an axis by at least 360 degrees taught by Fox '834 teaches the claimed laser structure of claims 1 and 9, which would be capable of being continuously tunable.

In response to applicant's argument that the combination of Mehuys and Fox would not result in a continuously tunable laser because the rotating scheme of Fox would simply extinguish the

current laser mode, the claim states the second reflecting element being rotatable about an axis by at least 360 degrees. The claimed structure of claims 1 and 9 require only that the second reflecting element be capable of rotating about an axis by at least 360 degrees, which is taught by Fox ‘834. The claimed structure does not require the second reflecting element of Mehuys '432 to be rotated about an axis by at least 360 degrees and so extinguish the current laser mode. Therefore, the combination of Mehuys ‘432 and Fox ‘834 would not result in the rotating scheme extinguishing the current laser mode.

In response to applicant’s argument that the grating rotation of Fox is controlled to so that the laser emits two or more different wavelength pulses, Fox ‘834 is relied upon to teach a grating rotation (col. 3, lines 2-9). The combination of the laser structure of Mehuys '432 and the rotating grating of Fox '834 would result in a laser cavity which is capable of being continuously tuned. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6, 9, 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mehuya et al (U.S. Patent 5,537,432, hereafter ‘432) in view of Fox et al (U.S. Patent 4,868,834, hereafter ‘834).

Claims 1, 13-14: ‘432 teaches a wavelength tunable cavity, comprising:

a first reflecting unit (col. 9, lines 15-19 and Fig. 15, part 154) adapted to at least partially reflect an incident beam of electromagnetic radiation towards a second reflecting unit (col. 9, lines 15-19 and Fig. 15, part 152),

said second reflecting unit adapted to at least partially reflect an incident beam of electromagnetic radiation back towards said first reflecting unit, both reflecting units providing the formation of resonance modes of said electromagnetic radiation within said cavity , wherein an optical path of said beam within said cavity is defined in length by said first and second reflecting units (col. 9, lines 15-19),

a grating, which is arranged within said optical path of said beam being reflected by said first reflecting unit, said grating being adapted for tuning the wavelength of said beam (col. 9, lines 19-21).

‘432 does not explicitly teach the second reflecting unit is arranged being rotatable about an axis by at least 360 degrees for providing a continuous movement of the second reflecting unit along a circle path with respect to the grating, and the circle path of the second reflecting unit comprising at least a portions being arranged to intersect with the beam, which is redirected by the grating. However, ‘832 teaches a wavelength tunable laser cavity with a rotatable second reflecting unit being rotatable about an axis by at least 360 degrees (col. 2, lines15-21 and Fig. 1, part 22) for providing a continuous movement of the second reflecting unit along a circle path

with respect to the grating (col. 2, lines 45-54), and the circle path of the second reflecting unit comprising at least a portions being arranged to intersect with the beam, which is redirected by the grating (col. 2, lines 6-8) in order to rapidly tune a laser and emit varying wavelengths. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a wavelength tunable laser cavity with a rotatable second reflecting unit being rotatable about an axis by at least 360 degrees for providing a continuous movement of the second reflecting unit along a circle path with respect to the grating, and the circle path of the second reflecting unit comprising at least a portions being arranged to intersect with the beam, which is redirected by the grating in order to rapidly tune a laser and emit varying wavelengths.

Claim 2: ‘432 and ‘832 teach the cavity according to claim 1. ‘432 teaches a laser source, which comprises a gain medium (Fig. 15, part 156) emitting a beam of electromagnetic radiation through a front surface (Fig. 15, part 162) along said optical path towards said grating (col. 9, lines 15-21 and Fig. 15, beam toward part 158), and said first reflecting unit as a back facet (col. 9, lines 15-17 and Fig. 15, part 154).

Claims 3 and 15: ‘432 and ‘832 teach the cavity according to claim 1. ‘432 teaches the first and second reflecting units and the grating are arranged as a Littmann-cavity (col. 9, lines 13-15). ‘832 teaches a pivot point, the pivot point having a position substantially within the axis of rotation of the second reflecting units (col. 2, lines 5-14 and Fig. 1, part 22).

Claim 4: ‘432 and ‘832 teach the cavity according to claim 1. ‘832 teaches the axis of rotation of said second reflecting unit is arranged being substantially orthogonal to a plane defined by the first and second reflecting units and the grating (Fig. 1, part 22, orthogonal to axis 25 and 27).

Claim 5: ‘432 teaches a wavelength tunable cavity, comprising:

a first reflecting unit (col. 9, lines 15-19 and Fig. 15, part 154) adapted to at least partially reflect an incident beam of electromagnetic radiation towards a second reflecting unit (col. 9, lines 15-19 and Fig. 15, part 152),

the said second reflecting unit adapted to at least partially reflect an incident beam of electromagnetic radiation towards said first reflecting unit, both reflecting units providing the formation of resonance modes of said electromagnetic radiation within said cavity, wherein an optical path of said beam within said cavity is defined in length by said first and second reflecting units (col. 9, lines 15-19),

at least one grating adapted to redirect said optical path of said beam being reflected by said first reflecting unit towards said second reflecting unit, being adapted for tuning the wavelength of said beam (col. 9, lines 19-21).

'432 does not explicitly teach the at least one grating is arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to the first and second reflecting unit, the circle path of said at least one grating comprising at least a portion being arranged to intersect with said beam, which is reflected by said first reflecting unit. However, '832 teaches a wavelength tunable laser cavity with a grating arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to the first and second reflecting unit (col. 3, lines 2-9), the circle path of the grating comprising at least a portion being arranged to intersect with the beam, which is reflected by the first reflecting unit (col. 3, lines 2-9 and Fig. 2, part 25) in order to rapidly tune a laser and emit varying wavelengths. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a wavelength tunable laser

cavity with a grating arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to the first and second reflecting unit, the circle path of the grating comprising at least a portion being arranged to intersect with the beam, which is reflected by the first reflecting unit in order to rapidly tune a laser and emit varying wavelengths.

Claim 6: ‘432 and ‘832 teach the cavity according to claim 5. ‘432 teaches a laser source, which comprises a gain medium (Fig. 15, part 156) emitting a beam of electromagnetic radiation through a front surface (Fig. 15, part 162) along said optical path towards said grating (col. 9, lines 15-21 and Fig. 15, beam toward part 158), and said first reflecting unit as a back facet (col. 9, lines 15-17 and Fig. 15, part 154).

Claims 9, 13-14: ‘432 teaches a wavelength tunable cavity, comprising:

a first reflecting unit (col. 9, lines 15-19 and Fig. 15, part 154) adapted to at least partially reflect an incident beam of electromagnetic radiation towards a second reflecting unit (col. 9, lines 15-19 and Fig. 15, part 152),

said second reflecting unit adapted to at least partially reflect an incident beam of electromagnetic radiation back towards said first reflecting unit, both reflecting units providing the formation of resonance modes of said electromagnetic radiation within said cavity , wherein an optical path of said beam within said cavity is defined in length by said first and second reflecting units (col. 9, lines 15-19),

a grating, adapted to redirect the optical path of the beam being reflected by the first reflecting unit towards the second reflecting unit, the grating being adapted for tuning the wavelength of the beam by means of diffraction (col. 9, lines 19-21).

‘432 does not explicitly teach a redirection reflecting unit adapted to redirect the optical path of the beam, which is redirected from the grating towards the second reflecting unit, wherein the redirection reflecting unit is arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to the grating and the second reflecting unit, the circle path of the redirection reflecting unit comprising at least a portion being arranged to intersect with the beam, which is redirected by the grating. However, ‘832 teaches a wavelength tunable laser cavity with a redirection reflecting unit adapted to redirect the optical path of the beam (col. 2, lines15-21 and Fig. 1, part 22), which is redirected from the grating towards the second reflecting unit (col. 2, lines15-21 and Fig. 1, part 22 redirects to grating and second reflecting unit parts 25 and 27), wherein the redirection reflecting unit is arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to the grating and the second reflecting unit (col. 2, lines15-21 and Fig. 1, part 22), the circle path of the redirection reflecting unit comprising at least a portion being arranged to intersect with the beam, which is redirected by the grating (Fig. 1, parts 25 and 27) in order to rapidly tune a laser and emit varying wavelengths. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a wavelength tunable laser cavity with a redirection reflecting unit adapted to redirect the optical path of the beam, which is redirected from the grating towards the second reflecting unit, wherein the redirection reflecting unit is arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to the grating and the second reflecting unit, the circle path of the redirection reflecting unit comprising at least a portion being arranged to intersect with

the beam, which is redirected by the grating in order to rapidly tune a laser and emit varying wavelengths.

Claim 16: ‘432 and ‘832 teach the cavity according to claim 1. ‘432 teaches at least one of the reflecting units comprises at least one of: a mirror, a plan mirror, a cavity end mirror and a retro-reflecting unit (col. 9, lines 15-19).

Claims 7-8, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mehuya et al (U.S. Patent 5,537,432, hereafter ‘432) in view of Fox et al (U.S. Patent 4,868,834, hereafter ‘834) and further in view of Fink (U.S. Patent 4,862,468, hereafter ‘468).

Claim 7: ‘432 and ‘832 teach the cavity according to claim 5. ‘834 teaches the grating being rotatable about the same axis by at least 360 degrees. They do not explicitly teach a first and at least one second grating, the first grating having a first grating constant and the second grating having a second grating constant, which is different from said first grating constant, both gratings adapted to redirect said beam being reflected by said first reflecting unit towards said second reflecting unit. However, ‘468 teaches a wavelength varying cavity laser with a first and at least one second grating (col. 6, lines 55-64 and Fig. 6, parts 73 and 75), the first grating having a first grating constant and the second grating having a second grating constant, which is different from said first grating constant (col. 6, lines 41-49), both gratings adapted to redirect said beam being reflected by said first reflecting unit towards said second reflecting unit (col. 6, lines 55-64 and Fig. 6, parts 73 and 75 reflect back to part 13) in order to provide a varying wavelength output. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a wavelength varying cavity laser with a first and at least one second grating,

the first grating having a first grating constant and the second grating having a second grating constant, which is different from said first grating constant, both gratings adapted to redirect said beam being reflected by said first reflecting unit towards said second reflecting unit in order to provide a varying wavelength output.

Claim 8: ‘432, ‘832 and ‘468 teach a cavity according to claim 7. ‘468 teaches the grating being mounted to a rotatable support (col. 6, lines 53-55 and Fig. 6, part 69), and each grating comprising: the same axis of rotation (col. 6, lines 53-55 and Fig. 6, part 69), and the same circle path comprising the same portion being arranged to intersect with said beam (col. 6, lines 55-60), which is reflected by said first reflecting unit (col. 6, lines 50-55).

Claim 10: ‘432 and ‘834 teach the wavelength tunable cavity according to claim 5. They do not explicitly teach the second reflecting unit and the grating are both arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to said grating. However, ‘468 teaches a wavelength varying cavity laser with a second reflecting unit and the grating are both arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to said grating (col. 6, lines 53-60 and Fig. 6, “rotatable mirror” part 61 and “rotatable grating” part 73) in order to provide a unique spectral line. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a wavelength varying cavity laser with a second reflecting unit and the grating are both arranged being rotatable along a circle path about an axis by at least 360 degrees for providing a continuous movement with respect to said grating in order to provide a unique spectral line.

Claim 11: ‘432, ‘834 and ‘468 teach cavity according to claim 10. ‘432 teaches a laser source, which comprises a gain medium (Fig. 15, part 156) emitting a beam of electromagnetic radiation through a front surface (Fig. 15, part 162) along said optical path towards said grating (col. 9, lines 15-21 and Fig. 15, beam toward part 158), and said first reflecting unit as a back facet (col. 9, lines 15-17 and Fig. 15, part 154).

Claims 12 and 17: Regarding claims 12 and 17, the arguments applied above to the apparatus described with regards to claims 1-11 and 12-16 are applicable to the method claims as well.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK STAFFORD whose telephone number is (571)270-1275. The examiner can normally be reached on M-Th 7:30-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. S./
Examiner, Art Unit 2828

/Minsun Harvey/

Supervisory Patent Examiner, Art Unit 2828